

### **Remarks**

The examiner's reconsideration of the application is urged in view of the amendments above and comments which follow.

Claim 1 now specifies that the first and second active layers are separate, and are coupled together by an intermediary layer comprising a non-crystalline material. Claim 1 thus includes the features of previous claim 3, and specifies the nature of the intermediary layer. Support for the latter amendment is provided by the various examples of the intermediary layer described in the description and claimed in previous claims 19-21.

Claim 22 refers to the output of the radiation source being in the infrared frequency range, a feature discussed in the specification. Claim 23 refers to an optical fibre attached to the second active layer, a feature shown in example 10 of the description and illustrated in Figure 4. Claim 24 specifies that the active layers are made of semi conductive material. Support for this amendment is provided by the references to the example of the active layer described in the description and mentioned in the previous claim 11 and references on pages 3 and 4 of the description to band gap energies of the active layers.

Claims 25 - 29 set out various qualities of the intermediary layer as discussed in the specification. Independent Claim 30 is directed to a radiation source in which the two active layers are of semiconductors, and are situated on either side of the intermediary layer. Claims 31-54 are dependent from claims 30 and corresponds to selected subsidiary claims dependent on Claim 1.

Turning to the Examiner's novelty/obviousness rejections on page 3 of the office action, it is pointed out that the layer (1) of Figure 3 of 10 is crystalline, i.e. sapphire. The layer (1) is, in fact, a substrate on which the overlying layers, up to and including the active layer (5), are epitaxially grown (column 3 lines 34-45). Chen therefore fails to disclose any non-crystalline

intermediary layer between the active layer (5) and the wavelength converting layer (13).

The non-crystalline intermediate layer enables two active layers to be coupled together by means other than epitaxial growth. This means that the active layers can be of two very different materials (heterostructures) with large lattice mismatch differences. In Chen the choice of lattice spacing for the material forming the active layer (5) will be limited by the lattice spacing of the molecules constituting the sapphire substrate.

Similarly, Mueller Mach fails to show any type of non-crystalline intermediary layer between two active layers.

In any case, it is noted that the earlier filing date in respect of Mueller Mach is September 27, 1999 whereas the earliest priority date for the present application is April 27, 1999. It is therefore submitted that Mueller Mach is not a proper reference against the present application. Furthermore, Mueller Mach fails to disclose any type of intermediary layer which separates two active layers, none of the active layers actually being separate in Mueller Mach.

It is therefore submitted that claim 1, and hence all the dependent claims therefrom, is both novel and non-obvious over Chen and Mueller Mach.

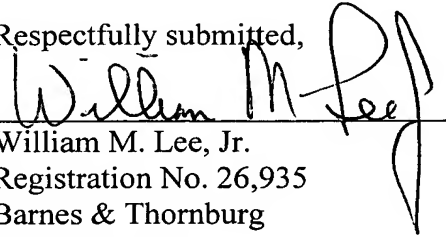
In addition, neither of the cited references discloses an infrared radiation source having two active semi conductor layers respectively for generating primary radiation and converting that radiation into secondary radiation, and the intermediary layer disposed between the semi conductor layers, as required by claim 30. Accordingly, claim 30 is also novel and non-obvious over the cited art, as are its dependent claims.

In view of the foregoing, it is submitted that the claims distinguish from the prior art and are allowable thereover. The examiner's further and favorable reconsideration is therefore urged.

Also, since this response is being submitted during the fifth month following the examiner's office action, an appropriate petition for extension of time is submitted herewith.

May 17, 2004

Respectfully submitted,

A handwritten signature in black ink, appearing to read "William M. Lee, Jr.", is written over a horizontal line. The signature is stylized with a large, looped "L" and a distinct "Jr." at the end.

William M. Lee, Jr.  
Registration No. 26,935  
Barnes & Thornburg  
P.O. Box 2786  
Chicago, Illinois 60690-2786  
(312) 214-4800  
Facsimile (312) 759-564